Two methods of welfare assessment have been compared to assess welfare in 16 organic flocks of laying hens in the Netherlands: Animal Needs Index and Plumage Damage Score as a measure of feather pecking. Animal Needs Index focuses on housing and management and the plumage damage method only looks at the consequences of feather pecking. The correlation between Animal Needs Index and Plumage Damage Score was weak: -0.54. A positive judgment according to Bartusseks Animal Needs Index did not coincide with little feather pecking. Not all the factors which are known from scientific studies as being associated with feather pecking during rearing or at later age are adjusted to the Animal Needs Index. Animal Needs Index, nor Plumage Damage Scoring alone is predictive enough for assessing animal welfare in poultry. We suggest to use a combination of both methods and call a production unit only ‘welfare friendly’ if it scores well enough according to both methods. It also might be wise to adapt the Animal Needs Index to recent scientific insights.

Abstract:

Keywords: animal welfare, alternative housing, Animal Needs Index, feather pecking, organic poultry, welfare assessment
Introduction

Based on its appearance (low stocking density (6 animals per m$^2$), outdoor area available (4m$^2$ per animal), as well as nests, perches and litter area available), organic poultry keeping seems to enhance animal welfare. However, feather pecking is still one of the main problems in organic poultry keeping (Bestman & Wagenaar (in press); Kjaer & Sørensen 2002). Feather pecking is an indicator for decreased welfare in both actor (El-Ethey et al 2000) and victim (McAdie & Keeling 2000). Two methods of welfare assessment have been compared to assess welfare in organic flocks: Animal Needs Index (ANI; Bartussek 1995) and Plumage Damage Score (PDS) as a measure of feather pecking. The Animal Needs Index focuses on housing and management and it uses a protocol to calculate an index per flock. The condition of the plumage and skin is one of the many aspects that is examined in the Animal Needs Index. However, there is no correction for age, despite the fact that damage caused by feather pecking increases with age. Moreover, because feather damage is one of the many factors in the index, its contribution to the end judgments is relatively small. Points that can be earned with good plumage and skin are only 8% of the maximum number of points that can be earned if all factors are optimum. The plumage damage method, which also calculates a mean per flock, only looks at the consequences of feather pecking.

A fundamental difference exists between welfare assessment through Animal Needs Index and Plumage Damage Score. The Animal Needs Index assesses factors that ‘in general’ are known to affect animal welfare. The Plumage Damage method focuses on how the animals in a particular flock assess their environment themselves (if there are shortcomings, they start feather pecking and plumage damage appears).
Methods

For 16 organic flocks of laying hens both Animal Needs Index and Plumage Damage Score were calculated. In the case of Animal Needs Index one person visited all 16 flocks to measure housing systems and interview stockpersons. The protocol used is described by Bartussek (1995).

Plumage Damage Score was assessed by 2 different persons when flocks were between 50 and 70 weeks of age. Therefore, the body of a hen was divided into 9 areas that were scored on a scale from 1 (no damage) to 9 (blood or (old) wound visible). Plumage Damage Score was performed on a sample of 40 birds. In order to prevent scoring the same bird twice, in smaller flocks a sample size of 20 was used. Birds were randomly scored at a transect, both inside the hen house and in the outdoor area. In order not to disturb the animals and to prevent selecting relative tame birds, birds were not handled, but scored within a distance of 2 meter from the observer. Based on the sample, a mean was calculated for each flock.

According to their score all flocks were ranked for both methods and the Spearman rank correlation coefficient was calculated.

Results

Results are presented in table 1.

\[ R_s = 1 - \frac{6 \Sigma d^2}{n^3-n} \] whereas \( R_s = \)Spearman rank correlation coefficient, \( d = \)difference in rankscore between ANI and PDS series and \( n = \)number of flocks/ stables.

\[ R_s = -0.54 \ (P < 0.05). \]
Discussion

The correlation between Animal Needs Index and Plumage Damage Score was weak. A positive judgment according to Bartussek’s Animal Needs Index did not coincide with little feather pecking. Therefore factors other than the ones included in the Animal Needs Index, must determine the extent of feather pecking.

Circumstances during rearing are of crucial importance for the development of feather pecking, but are not included in the Animal Needs Index. Features during rearing associated with feather pecking in laying hens are: stocking density >10 birds per m², having no access to elevated perches (Huber-Eicher & Audigé 1999), absence of litter (Blokhuis & Arkes 1984; Johnsen et al 1998; Huber-Eicher & Sebö 2001), absence of a pecking incentive such as scattered grain (Blokhuis & van der Haar 1992), absence of daylight (Keppler & Lange 2001) and absence of a motherhen (Perré et al 2002). The possibility exists that feather pecking starts before the flocks arrive on the laying farm (60% of the organic flocks in the Netherlands are bought at the age of 16-18 weeks (Bestman & Wagenaar in press). This may explain for the low correlation between Animal Needs Index and the Plumage Damage Score.

Flocks involved in this study were also part of a larger study in which 63 flocks were involved (Bestman & Wagenaar in press). In this study, as well as in another study (Green et al 2000), features of laying farms did prove to be associated to the extent of feather pecking. Significant features found by Bestman & Wagenaar (in press), were: a low percentage of hens in the flock using the outdoor run, age at purchase 16-18 weeks and a decreasing number of cockerels present in the flock. Significant factors found by Green et al (2000) were less than 50% of the birds from a flock using the outdoor run, diet being changed three or more times during lay, inspections done by one person, no loose litter being left by the end of lay, hen house temperature being less than 20°C, lights turned up when the flock was inspected and bell drinkers being used. Not all of these features are included in the Animal Needs Index.
Feather pecking is regarded as an indicator for reduced animal welfare in both actor (Etthey et al. 2000) and victim (McAdie & Keeling 2000). The findings of our study suggest that too much emphasis on housing and management features (92% in the ANI-protocol) does not sufficiently predict animal welfare. However, Plumage Damage Score alone does not reflect welfare too. It may be possible that the housing and management is not appropriate, thus enhancing feather pecking, but that beaktrimming or reduced light intensity is used in order to prevent feather pecking damage. Beaktrimming is not welfare friendly because it is painful in the short and in the long term (reviewed by Hughes & Gentle 1995). Poultry kept at low light intensities in general are more afraid (Hughes & Black 1974) and perform more stereotypic pecking (Kjaer & Vestergaard 1999), both indicating decreased welfare.

Conclusions

Animal Needs Index, which is based mainly on housing and management features, nor Plumage Damage Scoring alone is sufficiently predicts animal welfare in organic and other alternative poultry flocks. We suggest to use a combination of both methods and call a production unit only ‘welfare friendly’ if it scores well enough according to both methods. It also might be wise to adapt the Animal Needs Index to recent scientific insights.

References


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Table 1: Outcomes of Animal Needs Index and Plumage Damage Score in flocks 1-16, as well as ranks in the respective series.

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2 DPS <2: no or little feather damage; DPS 2-3: moderate feather damage; DPS >3: severe feather damage